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Identifying Sustainable Style Consumers with Decision Tree Predictive Model

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1. Research Background

Over the last decade, researchers have proposed rational ways to promote sustainable apparel consumption; however, such strategies may not work because clothing is expected to serve the emotional, symbolic, and social function (O'Cass, 2000). Recently, style consumption (SC) has been proposed as a way to foster sustainable clothing consumption, which refers to “a distinctive mode of pursuing an individual style whose design one perceives classic and at the same time speaks about oneself” (Cho et al., 2015, p. 2). Also, consumers who focus more on stylishness (enduring but individual style) rather than fashion were found to be more likely to engage in sustainable apparel consumption practices. Because SC connotes sustainable consumer behavior, we label it as sustainable style consumption (SSC). Despite its importance, the key factors that determine SSC have not been clearly identified. The purpose of the study is to identify important factors that describe SSC with RPART method, a powerful analytic tool that demonstrates significant variables that explain the target variable in terms of explanatory power and variance (Therneau et al., 2015).

2. Methods and Results

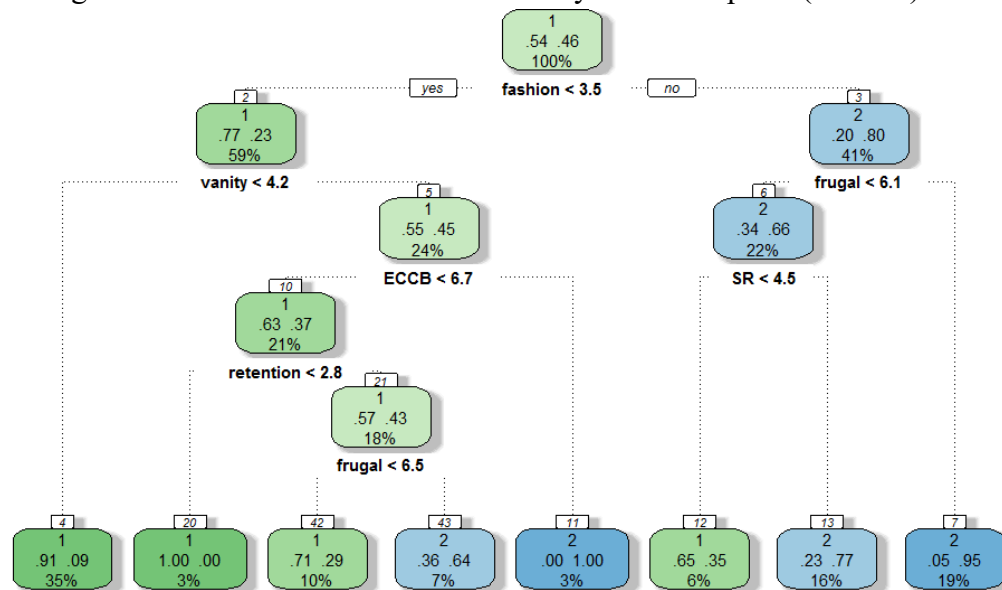
A total of 426 usable responses were collected from online consumer panelists. A decision tree predictive model of SSC was built based on six lifestyle traits drawn from literature (i.e., frugality, fashion consciousness, vanity, ecologically conscious consumption behavior, social responsibility, and product retention tendency). The mean age of participants was 43.9 (ranging 18-84), and gender was evenly distributed (52.1% male). Measurement items were adapted from existing scales.

A binary decision tree was created with R, using RPART (recursive partitioning) method, with partitioned total responses into testing data set (70%; $n = 298$) and validating data set (30%; $n = 128$). The resultant decision tree of SSC was comprised of eight terminal nodes: four high SSC segments and four low SSC segments. The decision tree started with a root node ($n = 298$) that split into two branches by fashion consciousness (< 3.5 , 59%; ≥ 3.5 , 41%), suggesting that fashion consciousness is the most important factor in predicting SSC. Further nodes are presented in Figure 1. The result indicated that the largest segment (19%) of high SSC group was explained by high levels of fashion consciousness (≥ 3.5) and high frugality (≥ 6.1).

We validated the final model's performance by conducting error matrix and receiver-operating characteristic (ROC) analyses with the validating data set. The results showed satisfactory accuracy (AUROCC 0.81) with a low misclassification rate (error rate of 21%). Finally, Gini variable importance by random forest algorithms was computed by building five hundreds of decision trees ($ntree = 500$), which confirmed the relative importance of variables

corresponding to our tree model.

Figure 1. Decision Tree of Sustainable Style Consumption (n = 298)



* Fashion (Fashion Consciousness); ECCB (Ecologically conscious consumption behavior); SR (Social Responsibility); Retention (Product Retention Tendency); Frugal (Frugality)

* "1 (low SSC group)" or "2 (high SSC group)" denotes which group is dominant in the node

3. Conclusion and Implication

The proposed decision tree model provides information on segmenting populations into SSC groups based on key lifestyle traits. Although previous research suggests that high fashion consciousness is negatively associated with sustainable apparel consumption, our results show that high fashion consciousness, jointly with high frugality and high social responsibility, characterizes the high SSC segment. As high SSC consumers are more likely to purchase more environmental apparel and engage in sustainable apparel divestment, our decision tree model can be used by practitioners to efficiently target and develop marketing strategies. Because fashion consciousness is a self-oriented value whereas social responsibility and frugality are relatively others-oriented value, practitioners should highlight how consumers can achieve both values by purchasing products that match their individual style or have classic design. Eco-fashion companies can reach the high SSC segment by showing how to style their products in a way that fits the trend via advertisements and SNS channels, while promoting the importance of being frugal and socially responsible.

4. References

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